REMARKS

By the present Amendment, claims 1, 8, 12, 14, and 16 have been amended, and claims 18-27 cancelled. Claims 28-33 are newly presented for consideration. Accordingly, claims 1-17 and 28-33 are now pending in the application. Claims 1, 8, 12, 14, 16, 17, and 29-33 are independent.

In the Office Action of March 9, 2007, claims 1, 2, 6, 8-16, 18, 22, and 26 were rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 6,511,426 issued to Hossack et al. ("Hossack") in view of U.S. Patent No. 6,413,219 issued to Avila et al. ("Avila"). The cancellation of claims 18-27 has rendered part of this ground of rejection moot. Regarding the remaining claims, this rejection is respectfully traversed.

The Examiner's indication that claim 17 is allowed and that claims 3-5, 7, 19-21, 23-25, and 27 would be allowable, if rewritten in independent form to include all the limitations of the base claim and any intervening claims, is noted with appreciation.

Claims 1, 2, 6, 8-16, 18, 22, and 26 were rejected under 35 USC103(a) as being unpatentable over Hossack in view of Avila. Regarding this rejection, the Office Action alleges that Hossack discloses a system and method for adjustable generating two- and three-dimensional representations for combining two types of B-mode data. The Office Action indicates that the data can be combined multiple times pursuant to different relationships (weighting) and then displayed. The combination processor used to combine the images receives controls based upon user input of the parameters that the user wants to use to combine the image. Two of the types of images that can be combined include an image emphasizing texture and then image emphasizing structure. The Office Action further indicates that Avila discloses an

ultra sound system that comprises B-mode ultrasonic probes incorporating an array of transducers that transmit an ultrasound beam and receives the signal reflected back. Avila is also relied upon for disclosing a control unit for controlling the ultrasonic parts, an envelope detector, and a scan conductor. Applicants respectfully disagree, to the extent that the presently pending claims have been amended to recite features that are not shown or suggested by the art of record.

As amended, independent claim 1 defines an ultrasonic imaging system for transmitting an ultrasonic pulse to a living body, receiving the reflected ultrasonic pulse, and obtaining B-mode image data of the living body. The ultrasonic imaging system comprises:

> a structure extractor for extracting structure-emphasized image data in which a structure of a tissue in said living body is emphasized from said B-mode image data;
>
> a texture pattern extractor for extracting texture-emphasized image data in which a texture pattern coming from properties of a tissue in said living body is emphasized from said B-mode image data;
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> an image synthesizer for obtaining a synthesized image by weighting and combining said structure-emphasized image data and said texture-emphasized image data; and
>
> a display for displaying at least one of said structure-emphasized image data, said texture-emphasized image data, and said synthesized image;
>
> wherein said structure extractor and said texture pattern extractor extract said structure-emphasized image data and said texture-emphasized image data, respectively, from the same B-mode image data.

According to independent claim 1, the ultrasonic imaging system comprises a structure extractor, a texture pattern extractor, an image synthesizer, and a display. The structure extractor is used to extract structure-emphasized image data in which a structure of tissue in the living body is emphasized from the B-mode image data.

The texture pattern extractor extracts texture-emphasized image data in which a texture pattern coming from properties of tissue in the living body is emphasized from the B-mode image data. The image synthesizer is used for obtaining a synthesized image by weighting and combining the structure-emphasized image data and the texture-emphasized image data. The structure-emphasized image data, texture-emphasized image data, and/or synthesized image are subsequently displayed. Furthermore, the structure extractor and the texture pattern extractor respectively extract the structure-emphasized image data and texture-emphasized image data from the same B-mode image data. See page 9, lines 1-7 and page 26, lines 17-25.

According to the features of independent claim 1, it is possible to independently adjust the degree of emphasis of the structure, texture, or both. Thus, for example, it is possible for an operator to adjust a resulting image to meet specific preferences and/or criteria. By extracting the structure-emphasized image data and the texture-emphasized image data from the same B-mode image data, it is also possible to eliminate the gap between the domain for images depending on body movement during the data reception and the spatial gap in the body. Further, the degree of sharpness of the synthesized image of the structure-emphasized image data and the texture-emphasized image data can be increased.

The Office Action alleges that the combination of Hossack and Avila discloses the features of, for example, independent claim 1. Applicants' review of these references, however, suggests otherwise. Hossack discloses a medical diagnostic ultrasound system and method capable of reducing speckle in two and three-dimensional images. Hossack utilizes a compounding filter for speckle reduction (Col.9, Section A: "A Speckle reduction"). The compounding filter spatially

compounds two or more two-dimensional frames of data, preferably corresponding to parallel planes in the elevation dimension with one or more millimeters of spacing between each scan plane (Col. 9, lines 40-49). As an alternative to surface rendering, border detection to each image plane is applied (Col. 19, lines 21-24).

Hossack further discusses "Enhanced Imaging", and indicates that the sets of data may be used for enhanced imaging by combining various types of data independently of, or in addition to, the speckle reduction (Col. 20, lines 41-44). Here, data sets are passed to the combination processor (Col. 23, lines 43-47). The 2D representation may be used and may comprise a single polygon with a texture map representative of the 2D image or multiple small polygons (Col. 27, lines 38-44). Hossack discloses border detection and texture map representation using a plurality of data. Since plural sets of data are used, however, the results of border detection and texture map representation are affected by a gap of the domain for image depending on body movement that occurred during the reception of the plural data sets. In particular, two or more frames of data that are spaced apart, preferably corresponding to parallel planes in the elevation dimension (Col. 9, lines 40-49) are compounded. Consequently, the results of border detection and texture map representation are affected by a gap of a domain for image depending on a spatial gap in the body.

Contrary to the Hossack, the invention of independent claim 1 includes a structure extractor and a texture pattern extractor that are used to extract the structure-emphasized image data and the texture-emphasized image data, respectively, from the same B-mode image data. Since the structure-emphasized image data and the texture-emphasized image data are extracted from same B-mode image data, the claimed invention is not affected by body movement and

spatial gap in the body. Consequently, it is possible to increase the level of sharpness of the synthesized image of the structure-emphasized image data and the texture-emphasized image data.

Avila discloses a three dimensional projection image representing projection of a data volume in real time. However, Avila fails to provide any disclosure or suggestion for extracting both the structure-emphasized and texture-emphasized image data from the same B-mode image data."

It is therefore respectfully submitted that independent claim 1 is allowable over the art of record.

Claims 2-7 and 33 depend from independent claim 1, and are therefore believed to be allowable for at least the reasons set forth above with respect to independent claim 1. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

Independent claims 8, 12, 14, and 16 have each been amended to recite, in part, the feature of:

> wherein said structure extractor and said texture pattern extractor extract said structure-emphasized image data and said texture-emphasized image data, respectively, from the same B-mode image data.

As previously discussed with respect to independent claim 1, the art of record simply fails to provide any disclosure or suggestion for obtaining both structure-emphasized and texture-emphasized image data from the same B-mode image data.

It is therefore respectfully submitted that claims 8, 12, 14, and 16 are allowable over the art of record.

Claims 9-11 depend from independent claim 8, and are therefore believed to be allowable for at least the reasons set forth above with respect to independent claim 8. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

Claims 13 and 15 depend, respectively, from independent claims 12 and 14, and are therefore believed to be allowable for at least the reasons set forth above with respect to independent claims 12 and 14. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

Claim 28 is newly presented and depends from independent claim 17, which has already been allowed. Accordingly, claim 28 is believed to be allowable over the art of record.

The Office Action indicated, in part, that claims 3-5 and 7 would be allowable, if rewritten in independent form to include all the limitations of the base claim and any intervening claims.

By the present amendment, applicants have introduced independent claims 29-32, which reflect the subject matter recited in these allowable claims (3-5 and 7). Accordingly, claims 29-32 are believed to be allowable over the art of record.

For the reasons stated above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a Notice of Allowance is believed in order, and courteously solicited.

If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

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AUTHORIZATION

Applicants request any shortage or excess in fees in connection with the filing of this paper, including extension of time fees, and for which no other form of payment is offered, be charged or credited to Deposit Account No. 01-2135 (Case: 520.42926X00).

Respectfully submitted,
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